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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,282	01/08/2001	Sheng-Hsiung Chen	TS99-149B	6859

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EXAMINER

MITCHELL, JAMES M

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/755,282

Applicant(s)

CHEN, SHENG-HSIUNG

Examiner

James Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 34-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 34 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshioka (U.S 5,357,136).
3. Yoshioka (Fig 1,2a-e; Column 4, Lines 16-30) discloses a bond pad structure (30) comprising a substrate (1) with a plurality of conductive regions (defined by the area of item 15 that is not covered by item 14 and in contact with item 18) on said substrate, a passivating layer (14) formed over a portion of said regions with an opening (7) to each region, a barrier layer (18) formed over said passivating layer, and an aluminum (Column 4, Lines 16-17) conductive bonding pad (Item 19, abstract Lines 13-15; pad structure 30) formed over each said region and over said barrier layer whereby an upper surface of said conductive bond pad that inherently provides added adhesion (via top surface of pad) for subsequently formed bonds.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka as applied to claim 34 in combination with Pozder et al. (U.S 20010051426).
6. Yoshioka does not appear to disclose a copper pad, however Pozder teaches the use of copper.
7. It would have been obvious to one of ordinary skill in the art to form the pad of copper in order to provide a conductive metal for a bond pad as taught by Pozder (Para. 0004, Lines 1-2).
8. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka as applied to claim 34 and further in combination with Camilletti.
9. Yoshioka does not show the passivating layer consisting of silicon oxide however Camilletti discloses the use of silicon oxide as a passivating layer (Lines 46-47 and 50-51, Column 3).
10. It would have been obvious to one of ordinary skill in the art to modify the device of Yoshioka by incorporating a silicon oxide passivating layer (SiO) in order to protect the device surface from contaminants as taught by Camilletti (Lines 48-49, Column 3).
11. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka as applied to claim 34.
12. Yoshioka further discloses a conducting bond pad (30) forming an interlocking grid array in 4 bond pad via contact regions (7) per conducting bond pad which inherently increases surface area for improved adhesion, but does not appear to disclose that the via is 100 by 100 microns square and that the size of the structures are about 10 to 25 microns in width and approximately 4 microns in height.

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13. In any case, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

14. In addition, an interlocking structures or islands (as indicated in applicant's specification on page 20, line 13) are shown in Yoshioka as an array of islands (7, "openings"). As such, since the pad is locked to the islands and conductive regions via the barrier layer (Column 4, Lines 6-7 and 25-30), Yoshioka forms an interlocking grid array.

15. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka as applied to claim 34 and further in combination with Saran (U.S 6,232,662).

16. Yoshioka does not show a tantalum nitride barrier layer, however Saran (U.S 6,232,662) utilizes a barrier layer of tantalum nitride barrier layer (Column 8, Lines 4-8).

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17. It would have been obvious to one of ordinary skill in the art to form the barrier layer of Yoshioka with TaN in order to provide a barrier layer consisting of a refractory metal as taught by Yoshioka (Column 3, Lines 67-68).

Response to Arguments

18. Applicant's arguments filed July 31, 2002 have been fully considered but they are not persuasive. With respect to claim 34, applicant's contention that Yoshioka seems not to disclose applicant's interlocking grid array and that the openings in the reference appear to be electrical contact vias are immaterial. First, the reference does not have to specifically state that the structure is an interlocking grid array. The interlocking grid array is defined by the structural limitations set forth in the claim. As claimed, the prior art as recited in the office action has all of the limitations that make an interlocking grid array, therefore the prior art is an interlocking grid array regardless of whether the prior art calls it such, that is why the M.P.E.P allows for applicants to be their own lexicographer. As for applicant's statement that the openings of the prior art appear to be conductive vias, is noted, but does nothing to further applicant's claim. Applicant has not supported his contention with any facts to shift the burden of proof, except a subjective belief of what the opening "appear." Applicant's interlocking grid array as claimed and disclosed in its specification does not indicate that the interlocking grid array is mutually exclusive from a conductive via. It is examiner's position that an opening is a via, and since applicant's conductive material ("conducting pad") is placed in applicant's openings, applicant's openings are conductive vias. Examiner is puzzled by applicant's point, is applicant asserting that he does not have its own claimed

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interlocking grid array? In regards to applicant's reliance of differences between applicant's figures and the prior art is moot, because patentability is not determined by drawings but those limitations set forth in the claim. As such, applicant's broad claims are encompassed in the prior art. With respect to applicant's claim that the conductive layer of the prior art is a refractory metal, under careful review applicant will note that the refractory metal does not pertain to the bond pad, but an underlying layer (; the bond pad in the bond pad area (30) is disclosed as aluminum. With respect to applicant's claim that Camilleti deals with a different problem than applicant's invention, is moot because that reference was on relied on for its teaching of a type of passivation layer, not for its applicability in a bond pad. With respect to applicant's claim that the prior art is a method of processing patent as opposed to applicant's structure patent is without merit, since disclosures of an invention can be drawn from both method and device patents as well as journals, common knowledge etc.; the type of patent does not limit the search or its availability as prior art. Lastly, in regards to applicant's statements that examiner "relies on the specifications" of two different patents is irrelevant. The reason two references are used is because the invention is not disclosed in a single reference, which is why the M.P.E.P provides not only for anticipatory rejections but also obvious type. Pursuant to 35 U.S.C 103, citing multiple references and their disclosures, which are found in their specification, forms obvious type rejections. Lastly, since applicant failed to traverse examiner's assertion of well known, common knowledge, the well-known statement is taken to be admitted. The teaching reference of Pozder is provided to evidence copper being common knowledge

as a material for bond pads; however, it is noted that Pozder could have been used to clearly anticipate applicant's claims.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Mitchell whose telephone number is (703) 305-0244. The examiner can normally be reached on M-F 10:30-8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

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305-3432 for regular communications and (703) 305-3230 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-

0956.



jmm

November 12, 2002



DAVID E. GRAYBILL
PRIMARY EXAMINER